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PREMENSTRUAL SYNDROME: ANXIETY AND DEPRESSION

by

GAYE CHISHOLM

(C)

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE

OF . . . . . Master of Education. . . . . .

IN

COUNSELLING PSYCHOLOGY

DEPARTMENT OF EDUCATIONAL PSYCHOLOGY

EDMONTON, ALBERTA

SPRING 1987

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled Premenstrual Syndrome: Anxiety and Depression submitted by Gaye Chisholm in partial fulfillment of the requirements for the degree of Master of Education in Counselling Psychology.

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Date: April 6, 1987

Abstract

Statistically and clinically significant increases in anxiety and depression were found between intermenstrual and premenstrual cycle phases in 40 healthy, functional, community women aged 23 to 45 who reported moderate to extreme premenstrual anxiety and depression on the Premenstrual Assessment Form (PAF). The PAF was developed by Halbreich, Endicott, and Schacht (1982). The State-Trait Anxiety Inventory (STAI) and IPAT Depression Scale were used to measure anxiety and depression levels in the intermenstrual cycle phase (days 5 to 10) and the premenstrual cycle phase (within 6 days prior to menstruation). The findings indicate fluctuations of mood directly related to the menstrual cycle and are contrary to arguments relating premenstrual increase in negative affect to stereotypical attitudes or retrospective recall bias.

Positive correlations were found between the prospective measures of anxiety and depression and the retrospective PAF scales for anxiety and depression, indicating that the PAF is a useful instrument for the evaluation of premenstrual symptoms.

The study replicates the findings of Haskett, Steiner, Osmun, and Carroll (1980) in identifying two groups of women manifesting significant increases in symptoms premenstrually. One group is regarded as "pure PMS" and was symptom free in the intermenstrual phase. The second group demonstrated moderate

symptoms intermenstrually which were exacerbated premenstrually. In this study, 40% of the subjects manifested clinical levels of depression in the intermenstrual phase. Clinical evaluation of individual PMS symptom patterns could include the administration of the STAI and IPAT Depression Scale in the intermenstrual and premenstrual cycle phases to differentiate between the two groups.

The clinically significant levels of premenstrual anxiety and depression demonstrated require the serious attention of physicians and psychologists. Acknowledgement that PMS is a legitimate concern in healthy women creates an atmosphere in which management interventions can be discussed.

Table of Contents

I Introduction..... 1

II Review of the Literature
Overview of Premenstrual Syndrome..... 5
Definition and Methodological Probems in PMS Research.. 8
Etiological Theories..... 10
Biological Theories..... 11
Psychological Theories..... 13
Psychiatric Aspect of PMS..... 16
Anxiety and Depression in PMS..... 17
Summary..... 20
Specific Problems as Identified in the Literature..... 21
Hypotheses Stemming From Problems in the Literature
Research Question..... 22
Hypotheses 1, 2, 3, 4..... 22

III Methods and Procedures
Research Design..... 24
Sample..... 24
Instruments..... 26
Data Collection..... 29
Data Analysis..... 30

IV Findings
Hypothesis 1..... 32
Hypothesis 2..... 33
Hypothesis 3..... 36
Hypothesis 4..... 38
Auxillary Calculations..... 38
Summary of Findings..... 39

V Discussion and Implications..... 42
Summary..... 46
Implications..... 47
Implications for Counselling..... 48
Implications for Psychometric Assessment..... 49
Implications for Education..... 50

References..... 51

Appendices
Appendix A..... 56
Appendix B..... 59
Appendix C..... 60

Chapter I

Introduction

The focus of the present thesis was to examine the relationship between menstrual cycle phase and levels of anxiety and depression. Specifically, the main question to be answered was: Do anxiety and depression levels vary between intermenstrual and premenstrual cycle phases among women who report premenstrual anxiety and depression?

A majority of women are aware of menstrual cycle related changes in mood and behavior which are often considered as a normal, if inconvenient, aspect of being female. Some women are acutely aware of these changes which interfere with their marriages, family life, and work (Bancroft & Backstrom, 1984). It is these women who are identified as having "premenstrual syndrome" (PMS). Although occurring in conjunction with physical changes, women tend to experience the psychological changes in mood and behavior as being the most distressing and disruptive (Abplanalp, 1983; Clare, 1983; Woods, 1985). Premenstrual increases in depression and anxiety are among the most frequently reported psychological changes (Abraham, 1980; Clare, 1983; Halbreich, Endicott, Schacht, & Nee, 1982; Woods, Most, & Dery, 1982b). Change in negative affect is a controversial aspect of PMS research.

This brief introduction to the psychological component of

premenstrual syndrome, and the factors which contribute to this controversy are expanded upon in the literature review of this thesis. The following paragraphs briefly outline the main points considered in operationalizing the research question. Detailed information is provided in the literature review which concludes with a statement of formal hypotheses.

Sensitive instruments are required for research and clinical evaluation of PMS symptomatology. In order to make research more reliable, it is necessary to identify specific subgroups of premenstrual complaint and to assess levels of severity (Abplanalp, 1983; Halbreich, Endicott, & Schacht, 1982; Steiner, Haskett, & Carroll, 1980). Halbreich, Endicott, and Schacht (1982) developed the Premenstrual Assessment Form (PAF) to establish criteria for the evaluation of premenstrual syndromes and their severity. The PAF is a restrospective self-report questionnaire and is considered the most sensitive instrument currently available (Rubinow & Roy-Byrne, 1984). The PAF is a relatively new instrument and there is little independent validity information available.

Criticisms of retrospective self-report questionnaires include recall bias and stereotypical response patterns that may cause over-reporting of symptoms attributed to the premenstrual cycle phase. This is particularly important with regard to negative affect symptoms (Abplanalp, 1983; Clare, 1983; Ruble,

1979; Woods, Most, & Dery, 1982a). Recent evidence indicates that increased symptom severity tends to increase the accuracy of retrospectively reported symptoms (Halbreich, Endicott, Schacht, & Nee, 1982).

The necessity of specifying symptom subgroups and level of severity of premenstrual complaint, and of using prospective measurement led to the research design briefly outlined below. Full discussion of the sample, instruments, data collection and data analysis is included in the Method and Procedure chapter of this thesis.

In order to study the research question, the PAF was used to identify a sample of women reporting moderate to extreme increases in levels of anxiety and depression between the intermenstrual and premenstrual cycle phases. An anxiety scale and a depression scale were administered to each woman at two cycle phases (intermenstrual and premenstrual). The scores of the independent measures of anxiety and depression were correlated with the appropriate scales of the PAF to provide validity information for the PAF. Results of the research are reported in the Findings chapter.

Although there is debate in the research literature regarding the cause of premenstrual syndrome and its relationship to psychological and social factors, there currently is little doubt as to its existence (Abplanalp, 1983; Abraham, 1980;

Bancroft & Backstrom, 1984; Clare, 1983; Dalton, 1984; Halbreich, Endicott, Schacht, & Nee, 1982; Reid & Yen, 1981; Steiner et al., 1980; Woods, 1985; Woods et al., 1982a; Woods et al., 1982b). Doubt remains, however, in the general practice of medicine and psychology (Bancroft & Backstrom, 1984). Women seeking help for severe premenstrual syndrome frequently find their complaints invalidated or minimized. The present research can be expected to provide data supporting the claim that there are actual increases in anxiety and depression during the premenstrual phase of the menstrual cycle. Acknowledgement by physicians and psychologists, that premenstrual syndrome is a legitimate concern, serves to reduce confusion and creates an atmosphere in which management interventions can be discussed. The discussion and conclusion sections entail an overview of the implications of this study from research, therapeutic, and educational perspectives.

Chapter II

Review of the Literature

The purpose of this research, it will be recalled, was to determine whether or not there are measurable changes in anxiety and depression levels at different phases of the menstrual cycle among healthy functional women who report such changes. Premenstrual increase in negative affect is frequently reported by women who identify themselves as having premenstrual syndrome (PMS).

A review of the research literature on premenstrual syndrome is presented in this chapter, with emphasis on articles pertaining to changes in negative affect. The chapter includes an overview of premenstrual syndrome (PMS) and the symptomatology and prevalence of PMS. Difficulties in defining PMS and methodological problems in PMS research are discussed. Etiological theories, both biological and psychological, are presented. Each of these topics has implications for the research design. Implications are drawn at the conclusion.

Overview of Premenstrual Syndrome

An overview of PMS is presented to provide the reader with background information which places PMS in the context of the menstrual cycle, to discuss commonly reported symptoms, and to provide the estimate of the prevalence of premenstrual complaint.

The concept of PMS is controversial and complex, involving

physical, emotional, behavioral, and social aspects. In conjunction with the hormonal rhythm of the menstrual cycle, many women report the recurrent appearance or increase in symptoms during the luteal phase of the cycle and a return to normal function in the follicular phase of the cycle. A brief review and illustration of the physiological and hormonal changes of the menstrual cycle is provided in Appendix A.

Symptoms attributed to the premenstrual syndrome are many and varied, and can be divided into three categories: (a) physical. (b) emotional, and (c) behavioral. Common physical symptoms include: a sensation of bloating, water retention, breast tenderness, cramping, weight gain, fatigue, headache, lower backache, and decreased coordination (Abraham, 1980; Dalton, 1984; Halbreich, Endicott, Schacht, & Nee, 1982; Woods et al., 1982b). The psychological component of PMS refers to the emotional and behavioral changes experienced. Emotional changes frequently reported include: irritability, depression, anxiety, tension, restlessness, hostility, changes in libido, food cravings, lability of mood, poor impulse control, and a sense of being out of control (Abraham, 1980; Halbreich, Endicott, Schacht, & Nee, 1982; Woods et al., 1982b). Behavioral changes reported are: changes in sexual activity, eating habits, sleep patterns, work patterns, aggressiveness, alcohol abuse, child abuse, and suicide attempts (Abraham, 1980; Dalton, 1984; Halbreich, Endicott,

Schacht, & Nee, 1982). Premenstrual mood changes may occur together with physical symptoms or may be found alone (Clare, 1983). As mentioned in the introduction, women tend to experience the psychological symptoms as being the most distressing and disruptive (Abplanalp, 1983; Woods, 1983).

It is necessary to establish how many women are affected by premenstrual syndrome and to what degree. Estimates of the prevalence of PMS vary widely. Seventy-five to ninety-five percent of women report at least one premenstrual symptom (Clare, 1983; Woods et al., 1982b). Thirty percent to fifty percent of menstruating women describe symptoms as mild to moderate (Woods et al., 1982b) and do not interfere appreciably with everyday life. Severe recurrent symptoms are experienced by 2% to 8% of women; one exception reported by 17% of women was severe premenstrual irritability (Woods et al., 1982b).

There is debate regarding the effect of age on the frequency of PMS reporting and symptom severity. There are indications that symptom severity increases with age (Backstrom & Bancroft, 1983; Haskett, Steiner, Osmun, & Carroll, 1980). The reverse was indicated by Reid and Yen (1981) and Woods et al. (1982b). In this research, the sample was chosen on the basis of symptom severity and can be expected to provide information relevant to this debate.

It is apparent that PMS is a cyclical phenomenon affecting a

large number of women to a severe degree and is therefore an important subject of study. Since the psychological symptoms of PMS appear to be of the greatest concern to women, changes in anxiety and depression were chosen as the subject for research. Cyclical change in negative affect remains a controversial area of PMS research. Factors contributing to the controversy are discussed in the following sections of the literature review.

Definition and Methodological Problems in PMS Research

In this section, methodological problems in PMS research are reviewed. The definition of PMS used and factors considered in the research design are presented.

Although PMS has been extensively researched, results tend to be inconsistent and inconclusive. Abplanalp (1983) lists problems which impede the evaluation of the psychological components of premenstrual syndrome:

1. The lack of a consensus on the definition of PMS (resulting in significant variation between studies with respect to severity, timing and course of symptoms).
2. The use of retrospective rather than prospective methods of data collection (which increases the likelihood of culturally based response bias).
3. Sampling errors.
4. Failure to assess and control for experimental bias introduced as a function of subject's perception of purpose

of evaluation.

5. Inadequate attention paid to timing within the cycle of data collection. (p. 517)

The word "syndrome" which, in medical literature usually denotes a specific combination of symptoms, may be used in PMS research to include any of a large number and combination of symptoms. (Abplanalp, 1983, p. 518)

Different researchers with various perspectives have identified several overlapping syndromes rather than a single syndrome (Abraham, 1980; Halbreich, Endicott, Schacht, & Nee, 1982; Moos, 1969; Steiner et al., 1980).

Recently, at a Workshop of the National Institute of Mental Health (NIMH), an operational definition was agreed upon:

Premenstrual syndromes: marked change in intensity of symptoms measured (daily) from cycle day 5 to 10, compared to the intensity within the six day interval prior to menses, for at least two consecutive cycles. (Blume, 1983, p. 2866)

The present research design has satisfied, wherever practicable, the foregoing criticisms by prospective testing across cycle phases on intermenstrual and premenstrual days according to this definition (see Appendix A, Figure 7). The Premenstrual Assessment Form (PAF) was designed to satisfy the need for specific symptom and severity categorization. The PAF was used to identify a specific subgroup of women who report moderate to

extreme change in anxiety and depression symptoms.

It was hoped that this research would provide information as to whether or not there are measurable increases in premenstrual anxiety and depression levels among women who report these specific symptoms. As mentioned in the introduction, the PAF is a relatively new retrospective questionnaire. Further discussion of retrospective questionnaires follows under the heading of Psychosocial Etiological Theories. By correlating the prospective measures of anxiety and depression with the appropriate scales of the PAF, the researcher provides additional validity information for the PAF.

Etiological Theories

Theories of cause reflect the attitudes of researchers, determine what research questions are asked, what methodology is used, and what therapies are recommended. Since premenstrual syndrome involves physical, psychological, and social aspects, it has attracted researchers from diverse fields and many theories have been postulated. This has created controversy as to the existence of premenstrual syndrome and particularly negative affect symptoms.

It is the assumption of this researcher that there is a biological factor underlying the premenstrual symptoms of anxiety and depression. Symptoms are manifested through the subjective experience, altered behavior, and social impact of each individual

woman. It is acknowledged that social and psychological factors can also alter the menstrual cycle itself and the ways in which premenstrual symptoms are manifested.

Hereafter, the literature review contains many prevalent etiological theories, both biological and psychological in orientation. Difficulties in research methodology and interpretation are discussed as they relate to the thesis.

Biological Theories

PMS researchers represent various sub-disciplines of medicine (Abraham, 1980; Dalton, 1984). The observations of such researchers are based on clinical populations of women experiencing severe problems who have sought help. A psychiatric perspective is represented by Halbreich and Endicott (1981, 1982) and Clare (1983). The theoretical orientation of these researchers is essentially biological, wherein the causation of premenstrual syndrome is viewed in terms of neuro-endocrine mechanisms. Inherent in the biological theories is the assumption that premenstrual syndrome is somatopsychic in origin. Further, psychological problems are considered to be caused by menstrual abnormalities (Cumming, 1984). Although a wide variety of theories have been postulated, a definitive pathophysiological cause and effective treatment have not been agreed upon.

Excess estrogen (Frank, 1931), progesterone deficiency (Dalton, 1984), or an imbalance in the estrogen-progesterone ratio

(Morton, 1950) have been suggested as causes of PMS. These theories form the rationale for progesterone and oral contraceptive therapies. Studies which attempt to correlate low progesterone or high estrogen levels with PMS symptoms have yielded equivocal results due to poor study design or flaws in procedures. Reid and Yen (1981) maintain that "estrogen excess or progesterone deficiency appears to be secondary to other neuro endocrine changes such that therapy directed toward manipulating sex steroid levels has met with limited success" (p. 97).

PMS has been attributed to prolactin elevation (Carroll & Steiner, 1978), prostaglandins (Horobin, 1983), the renin-angiotensin system (O'Brien, 1982), and hypoglycemia (Morton, 1950). Deficiencies of vitamin B_6, magnesium, vitamins A, D, and C, and niacin have been implicated. Excess intake of refined sugar, sodium, calcium, caffeine, alcohol, and tobacco have also been discussed (Abraham, 1980). Dietary changes form the basis of many therapeutic regimens.

Reid and Yen (1981) provide an excellent review of current theories and corresponding therapies. They maintain that most studies have provided inconclusive results due to lack of large, double blind, placebo controlled studies. They challenge the use of medication based upon inconclusive studies. Reid and Yen propose further study of endogenous opiates (endorphins) as underlying the pathophysiology of PMS.

Reid and Yen (1981) strongly endorse the biological position concerning the etiology of PMS when they state, "In the PMS, although there is little doubt that core psychological characteristics may modulate an individual's interpretation or expression of premenstrual symptoms, there is little to support the belief that psychological factors alone incite all other symptoms of PMS" (p. 97).

Psychological Theories

Psychological theorists tend to view premenstrual syndrome as being psychosomatic in origin; mood changes are regarded as a function of personal adjustment. This implies that women who report premenstrual mood changes are maladjusted. Although some are relatively old, the following theories have been influential in determining public and professional attitudes toward the concept of PMS. These theories contribute to the dismissal of premenstrual complaints as being invalid or not worthy of attention.

Personality theories. The woman reporting high levels of premenstrual symptoms has been found to have personality characteristics of instability and suspicion, is guilt-prone, apprehensive, unpretentious, and tense with much self-conflict (Taylor, 1979). Levitt and Lubin (1967) concluded that "menstrual complaints are related to an unwholesome menstrual attitude, to neurotic and paranoid tendencies, and to a lack of understanding

of motivations and feelings" (p. 280). Parlee (1973) criticized the latter study as "drawing a conclusion which seems more elaborate than is justified by the data" (p. 462). Personality studies have been criticized for what has been described as the "stigmatization of women" (Parlee, 1973).

Psychosexual theories. Psychosexual theories are primarily psychodynamic in nature and explain premenstrual syndrome in terms of the repudiation of femininity and non-acceptance of the female role (Paulson & Shainess, 1961). A root cause of menstrual problems is believed to be poor mother-daughter communication over the onset of menarche. This finding is contradicted in more recent studies (Osmun, Steiner, & Haskett, 1983; Woods et al., 1982b).

The sample used in this study was a community-based sample of healthy, functional women. The sample represents variety in marital status, parity, and occupation. The sample is discussed fully under Methodology and Procedures. It is noteworthy that the women in this sample are relatively highly educated and successful in careers; thus it is difficult to view these women as being maladjusted.

Psychosocial theories. The psychosocial approach to the etiology of premenstrual symptoms involves the idea that women do not actually experience any more problems premenstrually than at other times, but merely believe they do. Proponents deny the

existence of premenstrual syndrome and believe it is the result of stereotypic, socially learned beliefs shared by men and women alike about menstruation being a negative experience (Parlee, 1973). Accordingly, negative feelings and moods are attributed to biological processes like menstruation, while positive moods are attributed to environmental causes (Koeske & Koeske, 1975; Ruble, 1977). Young college students were used as subjects in much of the research which supports a psychosocial position. More recent research involving older women and women with more severe premenstrual symptoms refutes the psychosocial position (Osmun et al., 1983; Woods, 1985). Woods (1985) states:

> Negative affect had the most important effect on menstrual attitudes. Women who were more symptomatic had more negative attitudes. Thus it appears that menstrual attitudes are not merely a product of one's socialization but a function of women's experiences with symptoms that disrupt their lives. (p. 148)

Halbreich, Endicott, and Schacht (1982) reject the notion of sterotypical response as evidenced by the diversity of symptom patterns reported on the PAF.

Another psychosocial issue that is of immediate concern involves the lack of concordance between retrospective premenstrual questionnaires and daily symptom diaries. Evidence indicates that women report more symptoms in retrospect than

actually occur (Abplanalp, 1983; Clare, 1983; Parlee, 1973; Woods et al., 1982a). The greatest discrepancies refer to negative affect symptoms, particularly depression. Research on this issue involves the use of the Moos Menstrual Distress Questionnaire (MMDQ). Halbreicht, Endicott, Schacht, and Nee (1982) maintain that there is some discrepancy between the PAF and daily symptom records; however, this discrepancy is minimal at severe symptom levels.

The sample for the present research was chosen on the basis of specific symptoms at specific severity levels as retrospectively reported on the PAF. It was expected to provide evidence that women who report high levels of change in anxiety and depression between cycle phases do actually experience that change. In addition, this study provides a comparison of the prospective versus retrospective measures of anxiety and depression.

Psychiatric Aspect of PMS

The concentration of this thesis on change in negative affect necessitates the presentation of psychiatric views of premenstrual syndrome. There is evidence to suggest an overlap between premenstrual and psychiatric illness (Clare, 1983; Endicott, Halbreich, Schacht, & Nee, 1981). Clare (1983) reports that severe premenstrual complaint is closely associated with mild psychiatric illness of a neurotic type. Endicott et al. (1981)

view premenstrual changes characterized by a depressive syndrome as a mild or subclinical form of affective disorder. The difficulty of distinguishing between subclinical or undiagnosed psychiatric illness and severe premenstrual syndrome in otherwise healthy women is demonstrated in studies by Haskett et al. (1980) and Friedman, Sondheimer, Weinbaum, and Rickels (1985). In both studies, despite intensive screening of subjects, two groups of women were identified. Both groups manifested increases in symptom levels between cycle phases. One group is regarded as "pure PMS" and is symptom free during the follicular phase. The second group demonstrates moderate symptomatology in the follicular phase which is exacerbated premenstrually. Clare (1983) cites depression as being the single discriminating factor between these groups.

In attempting to establish that increased levels of premenstrual negative affect do occur in healthy women, the psychiatric aspect must be considered. A community-based sample of women was chosen for this study. The Subject Data Form and clinical screening were utilized to identify a sample of subjects without psychiatric history.

Anxiety and Depression in PMS

Central to this thesis are changes in levels of anxiety and depression reported to occur premenstrually. Very little of the literature deals specifically with these symptoms; rather, most

literature includes anxiety and depression within the larger context of physical, emotional, and behavioral premenstrual change. Reported changes in negative affect are controversial (Clare, 1983; Wood et al., 1982a; Parlee, 1973). It becomes apparent that it is difficult to distinguish between anxiety and depression in premenstrual syndrome. There appears to be confusion in the interpretation of terms between psychiatric professionals and lay people. Steiner et al. (1980) learned that the MDQ items "anxiety and depression" were interpreted by many women as "tension and dysphoria" respectively (p. 189).

Despite differences in terminology, there appears to be agreement that anxiety and depression do not usually exist as separate entities in PMS. Steiner et al. (1980) maintain that:

> Premenstrual tension syndrome (PMTS) does not appear to be an abbreviated form of an anxiety disorder, nor is it a mini-episode of endogenous depression. The core symptomatology of PMTS includes irritability, dysphoria, restlessness, tension, and emotional lability. Symptoms of anxiety and depression, when present, seem to be reactive to unexplained irritability and dysphoria. (p. 189)

Abraham's (1980) categories of PMT-A (Premenstrual Tension-Anxiety) and PMT-D (Premenstrual Tension - Depression) support the premise of the mixed nature of anxiety and depression. PMT-A is the more common of his subgroups (68%) and appears as anxiety

combined with depression. He found PMT-D, alone, to be unusual (3%) and regarded it as much more serious, requiring psychiatric consultation.

Golub (1976) found premenstrual levels of state anxiety and depression to be significantly higher than mid-cycle levels, but lower than psychiatric norm groups. She found trait anxiety scores to be low and not significantly correlated with premenstrual depression and anxiety scores. The terms state and trait anxiety are from the State-Trait Anxiety Inventory (STAI) which is described on page 28. The STAI refers to state anxiety as a transitory emotional state of anxiety. Trait anxiety refers to "anxiety proneness" as a stable personality characteristic.

Halbreich and Endicott (1982) focus primarily on depression as being prevalent in changes of mood reported to occur premenstrually. In the development of the Premenstrual Assessment Form (PAF), the term "syndrome" was used to differentiate from Research Diagnostic Criteria (RDC) for mental disorders, which are too stringent to use for premenstrual depressive features. They state, "The PAF criteria for depressive syndromes are similar to those of the RDC but differ in that impaired functioning or treatment seeking behavior is not required and duration may be less than a week" (p. 250).

Halbreich and Endicott (1982) reject the classic endogenous classification for premenstrual depressive features:

> On the contrary, it is far more common for women to have premenstrual depressive features often referred to as "atypical" in the sense that they are the opposite of the classic "endogenous" features and involve hypersomnia and reactivity of mood. (p. 253)

The foregoing researchers indicate that premenstrual anxiety and depression usually occur in combination and are of lesser degree than psychiatric classification for affective disorder. Depression occurring alone would be regarded as more serious than in combination with anxiety (Abraham, 1980; Clare, 1983; Golub, 1976; Halbreich & Endicott, 1982; Steiner et al., 1980). The extent to which depression underlies premenstrual complaint remains unclear.

The focus of the present study was on the magnitude of change in anxiety and depression between cycle phases. It was also expected to provide information concerning the relationship between anxiety and depression in premenstrual syndrome.

Summary

The literature on premenstrual syndrome is extensive; however, no consensus has been reached as to cause or treatment. Controversy regarding the negative affect symptoms of PMS has been discussed from methodological and etiological perspectives.

It is the view of this researcher that premenstrual negative affect symptoms do exist and have a physiological basis. It was

expected that this research would demonstrate measurable changes in anxiety and depression between cycle phases among healthy functional women. The concept of PMS has face validity in that women do say that they experience such changes. In expressing their concerns about PMS, women risk being labelled as maladjusted, neurotic, or psychiatric. Such labelling serves no useful purpose and is detrimental in that it prevents women from seeking help and adds to their fear and confusion. A more positive and useful approach requires public and professional acknowledgement that changes in negative affect can be related to the menstrual cycle and do occur in many healthy women.

Women seeking help for PMS require the time of the clinician to assess symptom patterns on an individual basis. Acknowledgement by physicians and psychologists that PMS is a legitimate concern serves to reduce confusion and creates an atmosphere in which management interventions can be discussed. Implications for research, education, and counselling will be discussed in the concluding chapter of this thesis.

Specific Problems as Identified in the Literature Review

1. There is little research dealing specifically with the symptoms of anxiety and depression as specific subgroups of PMS (Golub, 1976). Level of severity of complaint must also be specified (Abplanalp, 1983; Halbreich, Endicott, Schacht, & Nee, 1982; Steiner, Haskett, & Carroll, 1980).

2. Doubt remains as to whether there are actual differences in symptom levels between the premenstrual and other cycle phases. This is true, especially in regard to negative affect changes reported on retrospective questionnaires (Clare, 1983; Woods, Most, & Dery, 1982a).

3. The Premenstrual Assessment Form (PAF) is a new instrument designed to provide criteria for the diagnostic and research evaluation of PMS symptoms. There is little independent validity information available for this instrument.

Hypotheses Stemming From Problems Identified in the Literature

Research Question

Do anxiety and depression levels vary between premenstrual and intermenstrual cycle phases among women who report moderate to extreme premenstrual anxiety and depression on the Premenstrual Assessment Form (PAF)?

According to the definition of premenstrual syndrome, it would be expected that premenstrual levels of anxiety and depression would be higher than intermenstrual levels.

Hypothesis 1

Premenstrual measures of state anxiety will be higher than intermenstrual measures of state anxiety.

Hypothesis 2

Premenstrual measures of depression will be higher than intermenstrual measures of depression.

The State-Trait Anxiety Inventory (STAI) provides two scales for the measurement of anxiety. State anxiety refers to a transitory emotional state of anxiety. Trait anxiety refers to anxiety proneness as a stable baseline personality characteristic. By definition, trait anxiety measures should remain constant and provide a baseline against which premenstrual state anxiety measures can be compared.

Hypothesis 3

There will be no difference between premenstrual and intermenstrual trait anxiety measures.

Hypothesis 4

There will be a positive relationship between the independent measures of premenstrual anxiety and depression and the PAF Unipolar Scales on anxiety and depression.

Chapter III

Methods and Procedures

Chapter III contains detailed descriptions of the methods and procedures followed. Included are: descriptions of the research design, the sample, the instruments used, and the methods of sample selection, data collection, and data analysis.

Research Design

A bivariate correlational design was used to explore the relationship between a dichotomous independent variable (cycle phase) and level of the dependent variables: (a) state anxiety, (b) trait anxiety, and (c) depression scores.

Sample

A sample of 40 women, ranging in age from 23 to 45, with a mean age of 35.15 years was chosen from a pool of 325 volunteers who completed the Premenstrual Assessment Form (PAF) previously. Women reporting moderate (4), severe (5), and extreme (6) levels of change on the PAF Unipolar Scale items on Scales 1, 2, and 8 were eligible. (Scale 1. Low mood - loss of pleasure; Scale 2. Endogenous Depressive Features; Scale 8. Anxiety). Women on birth control pills and women indicating illness were excluded.

The original PAF pool (N=325) was composed of community volunteers from the Edmonton area in a variety of settings. The PAF was administered to individuals and groups such as hospital employees, graduate student classes, department store employees,

and PMS self-help groups. The original PAF pool was mostly white, middle-class, and relatively highly educated. They represented variation in age, parity, marital-status, occupation, and contraceptive use.

In the present research, a total of 46 women were tested. One woman did not complete testing. Results for five women were excluded when the Subject Data Form revealed oral contraceptive use. Demographic data on the 40 remaining subjects is listed as follows:

Table 1

Demographic Data for the Subjects (N=40) of the Study

Age:	Range	23 - 45 years
	Mean	35.15 years
Marital Status:	Married	28
	Single	8
	Divorced	4
Parity:	Number of Children	0 - 11
		1 - 5
		2 - 13
		3 - 10
		4 - 1
Education:	10 - 12 years	- 2
	12 - 14 years	- 18
	15 years	- 4
	15+ years	- 16
Occupation:	Housewife	5
	Nurse	4
	Medical Technician	4
	Clerical	8
	Professional	3
	Graduate Students	3
	Other	13

Instruments

Basically, four instruments or data collection forms were employed in this study. They were:

1. PREMENSTRUAL ASSESSMENT FORM (PAF). Halbreich, Endicott, and Schacht, 1982.
2. SUBJECT DATA FORM (SDF).
3. STATE-TRAIT ANXIETY INVENTORY (STAI), Forms X1, X2. Spielberger, Gorsuch, and Lushene, 1970.
4. IPAT DEPRESSION SCALE. Krug and Laughlin, 1976.

(see Appendix C for sample copies of these instruments.)

1. Premenstrual Assessment Form (PAF). The PAF was used to identify a specific sample of women reporting premenstrual anxiety and depression at moderate to extreme levels. It is a new instrument developed by Halbreich, Endicott, and Schacht (1982) to provide categorical and dimensional criteria for the evaluation of premenstrual change. Self-report is employed in which a woman describes her usual levels of change over the last three menstrual periods. The PAF consists of three sections:

1. Identification data and general information regarding menstrual history, recent cycles, and current physical health.

2. 95 items descriptive of changes in mood, behavior and physical condition, each of which is rated on a six point scale of severity of change from the woman's usual (non-premenstrual) state.

3. A brief description of the features of the premenstrual phase as they differ from her usual state, written by the woman.

Three non-competitive scoring systems occur in the PAF:

1. Seven bipolar continua.
2. Eighteen unipolar dimensional summary scales.
3. Typological categories for syndromes of premenstrual change.

The inclusion and exclusion criteria for the typological categories are modeled after, but not identical with, some of the categories of the Research Diagnostic Criteria. As an assessment vehicle, the PAF has proven to be capable of reflecting the great diversity in premenstrual changes among women and to be sensitive to individual and group differences.

The unipolar summary scales of interest are:

Scale 1. Low Mood--Loss of Pleasure

Scale 2. Endogenous Depressive Features

Scale 8. Anxiety

2. Subject Data Form (SDF). The SDF consists of three sections:

1. Section one was used to provide updated demographic information such as age, occupation, parity, and years of schooling.

2. Section two is designed to provide a relevant menstrual history and to precisely determine cycle phase.

3. Section three is designed to provide relevant information about physical health and lengthy hospitalization.

3. State-Trait Anxiety Inventory (STAI). The STAI is a standardized instrument widely used in the research and clinical measurement of anxiety in normal, medical, and psychiatric populations. The STAI is designed to measure state anxiety as well as trait anxiety and has impressive reliability and validity data published in the manual. Test-retest reliabilities for the A-Trait Scale range from .73 to .84. Test-retest reliabilities for the A-state scale are lower, ranging from .16 to .57. Alpha-reliability coefficients reflecting internal consistency range from .83 to .92 for A-state scores and .86 to .92 for A-trait scores. Alpha coefficients are more suitable reliability indicators for the A-state scale than test-retest coefficients. Concurrent Validity for the trait scale is in the region of .75.

State anxiety refers to "a transitory emotional state characterized by conscious feelings of tension and subjective awareness of heightened autonomic nervous system activity" (Golub, 1976, p. 5). Trait anxiety refers to "anxiety proneness, which is a relatively stable baseline personality characteristic" (p. 5). The STAI consists of two separate 20 item scales. The A-State scale is administered first and provides a measure of anxiety at the time of administration. The A-Trait scale is given second and provides a measure of how the subject generally feels. The range

of possible scores on each scale is from 20 to 80. The entire test requires 5 to 10 minutes to complete and is easily scored using a scoring key.

4. IPAT Depression Scale. The IPAT Depression Scale Questionnaire is a standardized test produced by the Institute of Personality and Ability Testing (IPAT) for use in clinical diagnosis and research on depression. Extensive information on reliability and validity are published in the test manual. Test-retest reliability is expected to be .93. Alpha reliability coefficients reflecting internal consistency are reported as being .85 to .93. The authors report that the scale has satisfactory validity which is corroborated by a vast independent research literature.

The IPAT Depression Scale Questionnaire consists of 40, three choice items which take approximately 10 minutes to complete and is easily scored using a scoring key. Two scores are obtained from the test. The 36-item uncorrected score, which deletes items overlapping with anxiety, was used.

Data Collection

Subjects were initially contacted by telephone; cycle-phase and required dates for testing were determined. Tests were administered by the investigator individually or in groups in Room 5-111 of the Clinical Sciences Building, University of Alberta. This research design required two testing sessions for

each subject. Subjects signed a consent form and filled out the Subject Data Form to provide updated demographic, medical and menstrual cycle information. The State-Trait Anxiety Inventory and IPAT Depression Scale were administered in the premenstrual cycle phase (within the last 6 days prior to menstruation) and intermenstrual cycle phase (days 5 to 10). Initial attempts to counterbalance the design to control for order of testing effects were unsuccessful. Difficulty in predicting when menstruation would occur and summer schedules interfered with counterbalancing. As a result, 26 women were tested first in the intermenstrual phase and second in the premenstrual phase. Fourteen women were tested first premenstrually and second intermenstrually. Follow-up phone calls verified the actual date of onset of menstruation to ensure that testing did take place in the premenstrual phase as defined.

Data Analysis

Hypotheses 1, 2, and 3. Data analysis took the form of a series of non-directional Student *t* tests for correlated groups, comparing the differences between means between premenstrual and intermenstrual measure scores. The independent variable was cycle phase; the dependent variables were: (a) STAI state scores, (b) STAI trait scores, and (c) IPAT depression scores.

Hypothesis 4. A correlation matrix was calculated to determine the relationship between premenstrual measures of

anxiety and depression and PAF Unipolar Scales for anxiety and depression.

Criterion significance was set at the .05 level. Michigan Terminal System (MTS) computer program SPSS-X was used in data analysis.

Chapter IV

Findings

In presenting the findings, the hypothesis will be restated, then a description of the analysis will be offered. Following directly after the analysis discussion, the conclusion will be stated. The figures presented in this chapter are from Tukey, J. W., Exploratory Data Analysis, Reading, MA, Addison Wesley, 1979. The stem and leaf displays, five number summaries, and box and whisker displays provide visual comparisons of the shape, spread, and levels of the distributions. These illustrations provide additional information not available through inferential statistics and will be referred to in the discussion chapter.

Hypothesis I

Premenstrual measures of state anxiety will be higher than intermenstrual measures of state anxiety.

Analysis. In order to test hypothesis I, a 2-tailed correlated groups t test was performed, comparing the mean intermenstrual STAI state anxiety score to the mean premenstrual STAI state anxiety score. The t test was statistically significant (t=-6.57, df=39, P=0.000). The mean premenstrual state anxiety score (51.9, SD=12.59) was greater than the mean intermenstrual state anxiety score (35.95, SD=8.51).

Conclusion. Therefore, hypothesis I is confirmed. The sample of women for this study do experience higher levels of

anxiety in the premenstrual cycle phase.

Figures 1 and 2 following, provide visual comparisons of the intermenstrual and premenstrual scoring distributions for the State Anxiety scale.

The stem and leaf display is a way of organizing raw data which combines the notions of a frequency table and a bar graph. The numbers shown are raw scores clustered into fives. To recreate any score you attach the leaf to the stem. For example, from Figure 1, intermenstrual distribution:

stems	leaves
3:	1 2 2 2 3 3 3 4 4 4 4
:	5 7 7 7
2:	0 2 2 4

The bottom line shows scores of 20, 22, 22, 24.

The next line up shows scores of 25, 27, 27, 27.

The next line up shows scores of 31, 32, 32, 32, 33, . . . etc.

Hypothesis II

Premenstrual measures of depression will be higher than intermenstrual measures of depression.

Analysis. In order to test hypothesis II, a 2-tailed correlated group *t* test was performed comparing the mean intermenstrual IPAT depression scale score to the mean premenstrual IPAT depression scale score. The *t* test was statistically significant (t=-4.20, df=39, P=0.000). The mean premenstrual IPAT depression scale score (31.0, SD15.16) was

Figure 1. Stem and leaf display of STAI State Anxiety Scores.

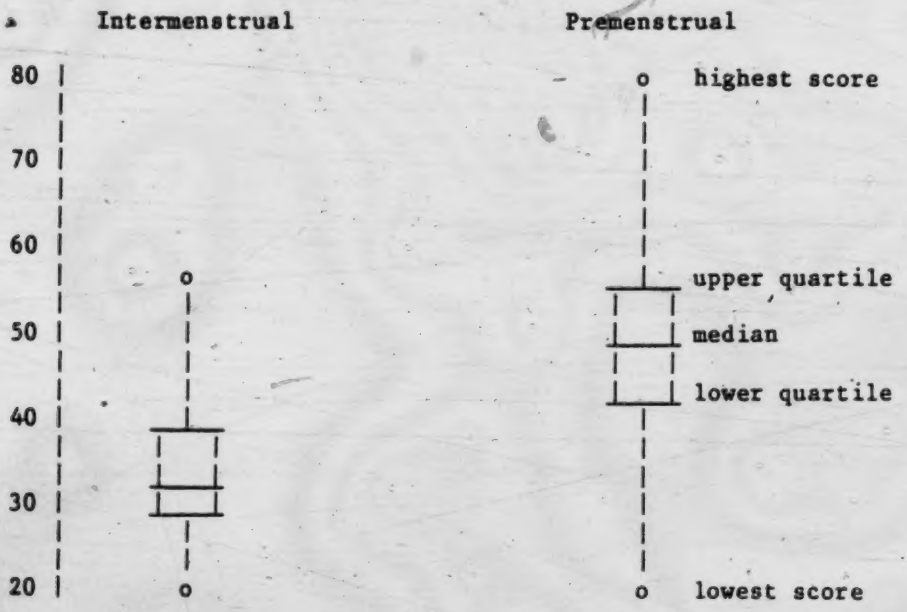
Intermenstrual		Premenstrual		Stems Leaves	5's Units
8 :		8 :			
:		:	6 8 9		
7 :		7 :	2		
:		:	7		
6 :		6 :	0 1 2 3		
:	5 6	:	5 6 7 7 8 9 9		
5 :	0 2	5 :	0 0 0 2 2 3 4		
:	5 6	:	5 5 8 8 9 9		
4 :	0 1 1 1 3	4 :	1 2 3 3 3 3		
:	5 5 5 6 6 6 7 7 9 9 9	:	5 6 6		
3 :	1 2 2 2 3 3 3 4 4 4 4	3 :			
:	5 7 7 7	:	9		
2 :	0 2 2 4	2 :	1		

N = 40

5 Number Summary

35		51		Median
32	40.5	43	59	lower quartile, upper quartile
20	56	21	79	lowest score, highest score

Figure 2. Box and whisker display of STAI State Anxiety scores.



higher than the mean intermenstrual IPAT depression scale score (23.68, SD=15.42).

Conclusion. Therefore, hypothesis II is confirmed. The sample of women for this study do experience higher levels of depression in the premenstrual cycle phase.

Figures 3 and 4 following provide visual comparisons of the intermenstrual and premenstrual scoring distributions for the IPAT depression scale.

Hypothesis III

There will be no difference between premenstrual and intermenstrual trait anxiety measures.

Analysis. In order to test hypothesis III, a 2-tailed correlated groups t test was performed comparing the mean intermenstrual STAI trait anxiety score to the mean premenstrual STAI trait anxiety score. The t test was statistically significant ($t=-3.53$, $df=39$, $P=0.001$). The mean premenstrual trait anxiety score (45.95, SD=9.47) was higher than the mean intermenstrual trait anxiety score (41.45, SD=10.46).

Conclusion. Therefore, hypothesis III is not confirmed. Premenstrual trait anxiety measures are higher than intermenstrual trait anxiety measures.

Figures 5 and 6 following, provide a visual comparison of the intermenstrual and premenstrual scoring distributions for the STAI trait anxiety scale.

Figure 3. Stem and leaf display of IPAT Depression Scale Scores.

Intermenstrual		Premenstrual		Stems Leaves	5's Units
6 :		6 :			
:		:	5 5 6		
5 :	2	5 :	2 3		
:	6 8 9	:	5		
4 :	0 2 3 4	4 :	0 0 1 2 2 3 4 4		
:	6 6 7 7 7	:	6 7 8 8 9		
3 :	1 3 4	3 :	1 3 4		
:	6 9	:	6 7 8 8 8		
2 :	0 2	2 :	0 1		
:	6 9 9 9 9	:	7 8 9		
1 :	1 1 1 2	1 :	0 3 3		
:	5 6 6 7 7 8 9 9 9	:	8 9 9		
0 :	0 2	0 :	4 4		

5 Number Summary

19.5		33.5		Median
9	37	18.5	42	lower quartile, upper quartile
0	52	4	56	lowest score, highest score

Figure 4. Box and whisker display of IPAT Depression Scale Scores.

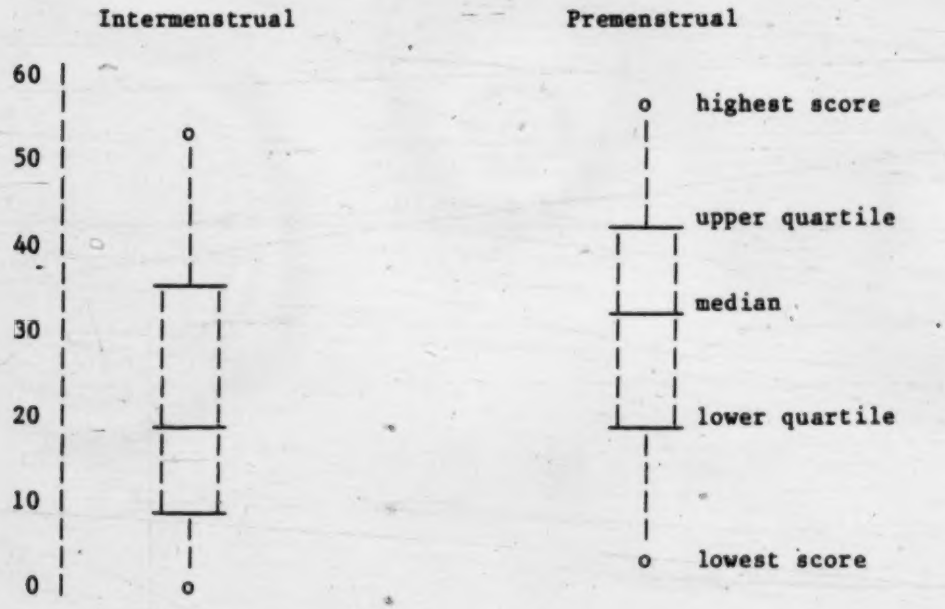


Figure 5. Stem and leaf display of STAI Trait Anxiety Scores.

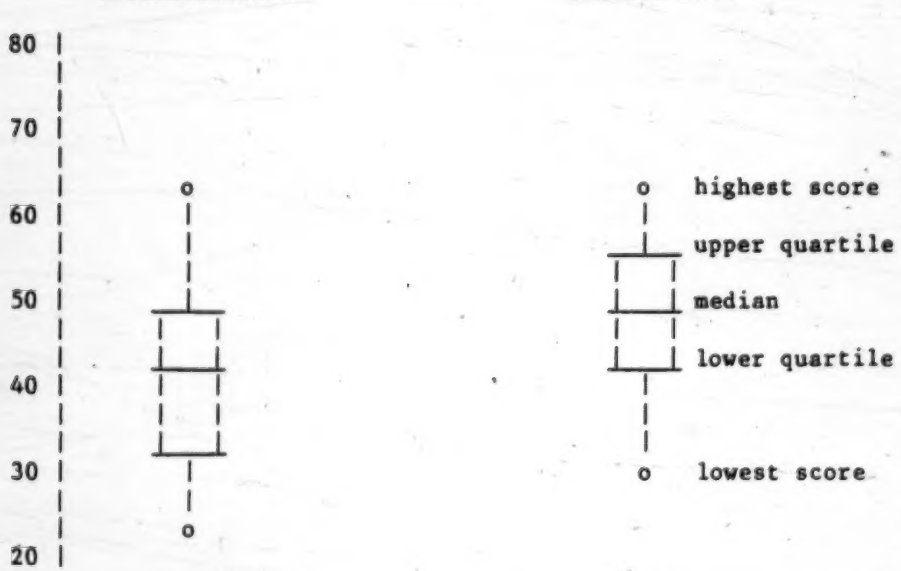
Intermenstrual		Premenstrual		Stems Leaves	5's Units
8 :		8 :			
:		:			
7 :		7 :			
:		:			
6 : 0 3 3		6 : 1 3			
: 5 5		: 5 6 7 9			
5 : 0 1 2		5 : 0 0 2 2 2 3 3 3 3 3 4			
: 6 7 7 7 7 7 8 8 9		: 5 7 8 9 9 9			
4 : 1 2 3 4		4 : 0 1 2 2 2 3 3 4			
: 6 8 8 9 9 9		: 6 7 8			
3 : 0 0 1 3 4 4		3 : 6 7 8			
: 6 7 8 9 9 9		: 8 8 9 9			
2 : 4		2 :			

N = 40

5 Number Summary

41.5		48.5		Median
32	48	40.5	53	lower quartile, upper quartile
24	63	28	63	lowest score, highest score

Figure 6. Box and whisker display of STAI Trait Anxiety scores.



Hypothesis IV

There will be a positive relationship between the independent measures of premenstrual anxiety and depression and the PAF Unipolar Scales on anxiety and depression.

Analysis. A correlation matrix was calculated to determine the relationship between premenstrual measures of anxiety and depression and PAF Unipolar Scales 1, Low Mood--Loss of Pleasure; Scale 2, Endogenous depressive features; and Scale 8, Anxiety.

A significant correlation (.43, P=0.003) was found between the STAI premenstrual state anxiety scores and PAF Unipolar Scale 8, Anxiety.

A significant correlation (.41, P=0.004) was found between the STAI premenstrual trait anxiety scores and the PAF Unipolar Scale 8, Anxiety.

A significant correlation (.53, P=0.000) was found between the premenstrual IPAT depression scale scores and the PAF Unipolar Scale 1, Low Mood--Loss of Pleasure.

A significant correlation (.40, P=0.005) was found between the premenstrual IPAT depression scale scores and the PAF Unipolar Scale 2, Endogenous depressive features (see Table 2).

Auxillary Calculations

In any controlled study, certain extra calculations have to be made to rule out counter-hypotheses and/or to elucidate or augment the findings beyond the specific research hypotheses.

Accordingly, a correlation matrix was generated between all of the variables in this study.

Not unexpectedly, significant correlations (see Table 2) were found between:

State and Trait anxiety intermenstrual scores (.57, P=0.000).

State and Trait anxiety premenstrual scores (.39, P=0.006).

No significant correlation was found between State anxiety premenstrual and intermenstrual scores (-.02, P=0.446).

No significant relationship was found between intermenstrual state anxiety and PAF Scales 1, 2, or 8.

A significant correlation (.68, P=0.000) was found between trait anxiety premenstrual and intermenstrual scores.

A significant correlation (.74, P=0.000) was found between depression premenstrual and intermenstrual scores.

Significant high correlations were found between:

Intermenstrual trait anxiety and intermenstrual depression (.87, P=.000).

Intermenstrual trait anxiety and premenstrual depression (.72, P=.000).

Premenstrual trait anxiety and intermenstrual depression (.68, P=.000).

Premenstrual trait anxiety and premenstrual depression (.72, P=.000).

Summary of Findings

To review the hypotheses:

1. Premenstrual measures of state anxiety will be higher than intermenstrual measures of state anxiety.

Table 2 Correlation matrix between all variables used in this study

	STAI State Anxiety Inter-Menstrual	STAI State Anxiety Pre-Menstrual	STAI Trait Anxiety Inter-Menstrual	STAI Trait Anxiety Pre-Menstrual	IPAT Depress. Inter-Menstrual	IPAT Depress. Pre-Menstrual	PAF Scale 1. Low Mood Loss of Pleasure	PAF Scale 2. Endo-genous Features	PAF Scale 8. Anxiety
STAI State Anxiety Intermenstrual	1.000	-.0221 P=.446	.5698 P=.000	.3067 P=.027	.4458 P=.002	.3758 P=.008	.2487 P=.061	.2236 P=.083	.1530 P=.173
STAI State Anxiety Premenstrual		1.000	.4167 P=.004	.3901 P=.006	.3888 P=.007	.5060 P=.000	.4597 P=.001	.2821 P=.039	.4266 P=.003
STAI Trait Anxiety Intermenstrual			1.000	.6758 P=.000	.8743 P=.000	.7174 P=.000	.5697 P=.000	.2168 P=.089	.3444 P=.015
STAI Trait Anxiety Premenstrual				1.000	.6786 P=.000	.7213 P=.000	.5287 P=.000	.3430 P=.015	.4127 P=.004
IPAT Depression Intermenstrual					1.000	.7399 P=.000	.5446 P=.000	.2786 P=.041	.2974 P=.031
IPAT Depression Premenstrual						1.000	.5296 P=.000	.4035 P=.005	.4029 P=.005
PAF Scale 1. Low Mood/Loss of Pleasure							1.000	.6941 P=.000	.6995 P=.000
PAF Scale 2. Endogenous depress. features								1.000	.6216 P=.000
PAF Scale 3. Anxiety									1.000

2. Premenstrual measures of depression will be higher than intermenstrual measures of depression.

3. There will be no difference between intermenstrual and premenstrual measures of trait anxiety.

4. There will be a positive relationship between the independent measures of premenstrual anxiety and depression and the PAF Unipolar Scales for anxiety and depression.

Hypotheses 1 and 2 were confirmed. It was determined that women of the sample do experience higher levels of state anxiety and depression in the premenstrual phase of the cycle. Greater change was observed in level of anxiety between cycle phases.

Hypothesis 3 was not confirmed. It was determined that premenstrual measures of trait anxiety are higher than intermenstrual measures of trait anxiety.

Hypothesis 4 was confirmed. It was determined that there are moderate positive relationships between premenstrual state and trait anxiety and PAF Scale 8, Anxiety. There are moderate positive relationships between the premenstrual depression measures and PAF Scale 1, Low mood - Loss of pleasure, and Scale 2, Endogenous depressive features.

Correlations were calculated other than those directly related to the hypothesis. These correlations indicate strong relationships between trait anxiety measures and depression measures. Moderate relationships between state and trait anxiety measures are apparent.

Chapter V

Discussion and Implications

The review of the literature in Chapter II offers the rationale for the hypotheses. That rationale may now be viewed with some greater degree of confidence. However, some of the findings require further comment, and some of the unexpected findings in particular must be examined.

The sample was composed of volunteer subjects from the community who reported moderate to extreme premenstrual depression and anxiety on a retrospective questionnaire (Premenstrual Assessment Form). These women were healthy, normally functioning, productive women. The research has demonstrated statistically significant increases in levels of anxiety and depression during the premenstrual phase of the menstrual cycle as measured by the STAI state anxiety scale and the IPAT depression scale. The greatest magnitude of change was shown in anxiety level. These results support the findings of earlier studies reporting fluctuations of mood directly related to the menstrual cycle (Abraham, 1980; Golub, 1976; Halbreich, Endicott, Schacht, & Nee, 1982; Woods et al., 1982b). These results are contrary to the argument that retrospective reports of premenstrual negative affect are due to stereotypical attitudes (Koeske & Koeske, 1975) or retrospective recall bias (Ruble, 1977).

Positive correlations between prospective premenstrual

depression measures and retrospective PAF scales (Scale 1: Low-mood/loss of pleasure. Scale 2: Endogenous depressive features. Scale 8: Anxiety) provide independent information validating the PAF scales for anxiety and depression. This supports the premise that the Premenstrual Assessment Form (PAF) is a useful instrument for the evaluation of premenstrual symptoms.

Premenstrual depression measures correlated more highly with PAF Scale 1: Low-mood/loss of pleasure than with Scale 2: Endogenous depressive features. This finding supports Halbreich, Endicott, Schacht, and Nee (1982) in their observation that premenstrual depressive features are "atypical" rather than endogenous in nature.

There is debate in the literature regarding the effect of age on the frequency of PMS reporting and symptom severity. In this research, the sample was chosen on the basis of symptom severity. The mean age for this sample was 35.15 years.

The significant increase in premenstrual trait anxiety was not hypothesized. It was expected that trait anxiety scores would remain constant and more closely resemble the intermenstrual state anxiety scores (Golub, 1976). The significant increase in premenstrual trait anxiety is explained by correlations between the State and Trait anxiety scales. There is overlap between what the two scales measure. In this study, auxiliary calculations revealed correlations of .57, $P=.000$, and .39, $P=.006$, between

state and trait intermenstrual and premenstrual scores, respectively. Although the trait anxiety levels did not remain constant across cycle phases, they are more closely related to the intermenstrual state anxiety levels.

Strong relationships between measures of trait anxiety and measures of depression in both cycle phases may be regarded by some as supportive of research relating premenstrual complaint to personality factors (Taylor, 1979). However, these strong relationships may mostly reflect the acknowledged difficulty in discriminating between the constructs of anxiety and depression for measurement purposes (Krug & Laughlin, 1976). Anxiety and depression are never put forward in the literature as unrelated constructs.

The stem and leaf displays, Figures 1, 3, and 5 in the Findings chapter, illustrate the distributions of raw scores. The reader will note that some of these levels have merged into clinical levels. Although there are no recent norms for the STAI and IPAT depression scales, a locally known unpublished study (Zingle, 1986) provides a comparison of State-Trait Anxiety mean scores for an Edmonton sample and a Misericordia Hospital Psychiatric sample with Spielberger's norms for specific groups (see Appendix B). In that the mean scores of the Zingle (1986) study are quite similar to the Spielberger norms, this would indicate greater confidence in the use of the STAI (1970) norms to

make inferences regarding the clinical significance of the present findings.

The state anxiety intermenstrual mean score of 35.95 is comparable to the Edmonton sample and Spielberger's working adult mean scores. From the perspective of the Spielberger norms, the premenstrual state anxiety mean score of 51.9 is clinically significant. From Figure 1, it is apparent that only six subjects (15%) in the intermenstrual phase manifested clinical anxiety levels (above Spielberger's general medical group). Twenty-nine subjects (72.5%) manifested clinical anxiety levels in the premenstrual cycle phase.

The intermenstrual trait anxiety mean score of 41.45 does indicate that the women in this sample may be a little more stressed than normal.

The bimodal distribution for IPAT Depression scores (Figure 3) is of particular interest. The data supports the findings of Haskett et al. (1980) and Freeman et al. (1985) in identifying two groups of subjects manifesting significant increases in symptoms premenstrually. One group was regarded as "pure PMS" and was symptom-free during the follicular phase. The second group demonstrated moderate symptoms in the follicular phase which were exacerbated premenstrually. Clare (1983) cites depression as being the single factor discriminating between these groups. Figure 3 illustrates this point. As one may observe in

Figure 3, there is a distinct bimodal distribution of scores on the IPAT Depression scale in the intermenstrual phase. Both groups fall within the NIMH definition of PMS which requires marked change in intensity of symptoms between cycle phases.

In the IPAT Depression Scale Manual, Krug and Laughlin (1976) recommend a raw score of 25 as being a convenient cutoff score differentiating depressed from normals (p. 31). In this study, the intermenstrual score of 23.7 is regarded as normal. The premenstrual IPAT depression mean score of 31.0 is in the clinically significant range. Krug and Laughlin (1976) recommend that Sten scores of 8, 9, or 10 (raw scores above 30) "should be taken seriously . . . and call for some follow-up" (p. 31). According to this criterion, in this sample 16 women in the intermenstrual phase and 22 women in the premenstrual phase manifested clinical depression.

Summary

The results clearly indicate that women who report moderate to extreme premenstrual anxiety and depression do experience those symptoms and that changes in levels of anxiety and depression between cycle phases are both statistically and clinically significant. This research also replicates findings of previous studies wherein two groups of women manifest significant increases in premenstrual symptoms. One group is regarded as "pure PMS" and the second group manifests premenstrual exacerbation of existing

anxiety and depression. This finding indicates that depression is an underlying factor for premenstrual symptoms in approximately half of the cases. Both groups of women fall within the NIMH definition of premenstrual syndrome. The women studied are healthy, functional women who maintain that they function well during other cycle phases, but experience difficulty in coping premenstrually.

Implications

The clinical levels of premenstrual anxiety and depression demonstrated in this research require the serious attention of physicians and psychologists. Dismissal of presenting complaints of premenstrual syndrome as being faddish or trivial would appear unwarranted or counter-productive. Acknowledgement by physicians and psychologists that PMS is a legitimate concern among healthy women opens the door to more thorough evaluation and discussion of management strategies.

The two groups of women identified in this research imply that approximately half of the PMS reporters demonstrate clear PMS symptomatology and approximately half demonstrate premenstrual exacerbation of underlying psychological distress. In the clinical evaluation of individual symptom patterns the STAI, IPAT Depression Scale, or Beck Depression Inventory could be administered in the intermenstrual and premenstrual cycle phases. These instruments would provide quick measures of anxiety and

depression levels at both cycle phases. More thorough clinical evaluation could include the Millon Clinical Multiaxial Inventory (MCMI) at both cycle phases. The MCMI provides good configurations on anxiety and depression and their somatic effects. In cases indicating clinical levels of depression in the intermenstrual phase, treatment could be directed at alleviating the depression through medication and/or counselling.

Implications for Counselling

Recent research (Keye, Hammond, & Strong, 1986) indicate that "women with premenstrual symptoms exhibited a significantly greater frequency of previously undetected medical, psychological, and marital problems than did controls." These findings are consistent with Clare (1983) who states, "There is no significant association between premenstrual complaint and overall social maladjustment but there is a statistically significant and positive association between disturbances in marital function and premenstrual complaint which is independent of psychiatric status" (p. 1).

These findings present promising avenues for research and therapeutic intervention from a family therapy perspective. It can be readily seen that the increased levels of anxiety and depression experienced in the premenstrual cycle phase decrease the ability of women to cope with environmental stresses. The family therapy perspective (which can be utilized in individual

counselling) avoids the labelling of women as psychiatric or maladjusted, while providing unlimited opportunities to examine the relationship between premenstrual symptoms and interpersonal concerns. Awareness of these inter-relationships and improved communication between family members could serve to increase support within the family, thereby alleviating premenstrual symptoms and family disruption.

Implications for Psychometric Assessment

The significant differences in measures of anxiety and depression between cycle phases on the STAI and IPAT Depression Scale suggest that cycle phase could be a factor requiring consideration when testing women with other psychometric instruments. The presence of anxiety and depression are non-cognitive factors which affect performance on intelligence tests. Personality inventories and instruments assessing affective states could be given different interpretations at different cycle phases. Evidence reflecting cyclical differences in MMPI scores is presented by Hammond and Keye (1985). Negative affect in the premenstrual phase could present a source of error affecting the reliability and validity of test results. This suggests that inquiries should be made regarding cycle phase if it may affect the individual and is relevant to the purpose of testing and to consequent decisions.

Implications for Education

PMS workshops and PMS self-help groups provide information on general health care, nutrition, exercise, relaxation, and life-style changes which help to reduce the intensity of PMS symptoms. Communication and support between women with similar PMS concerns provide reassurance and assistance in PMS management.

This research provides evidence that there are measurable increases in anxiety and depression in the premenstrual phase of the cycle which affirms the experiences of women with premenstrual syndrome. Information is also provided regarding underlying psychological distress in many of the women reporting premenstrual syndrome. This latter observation may be less palatable to women who prefer a physiological explanation for symptoms of depression and anxiety.

Caution is recommended in educational programs not to present PMS as being a unitary medical problem. Educational presentations should convey the more complex information relating premenstrual symptoms to interpersonal and marital concerns requiring individual consideration.

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Appendix A

The Menstrual Cycle

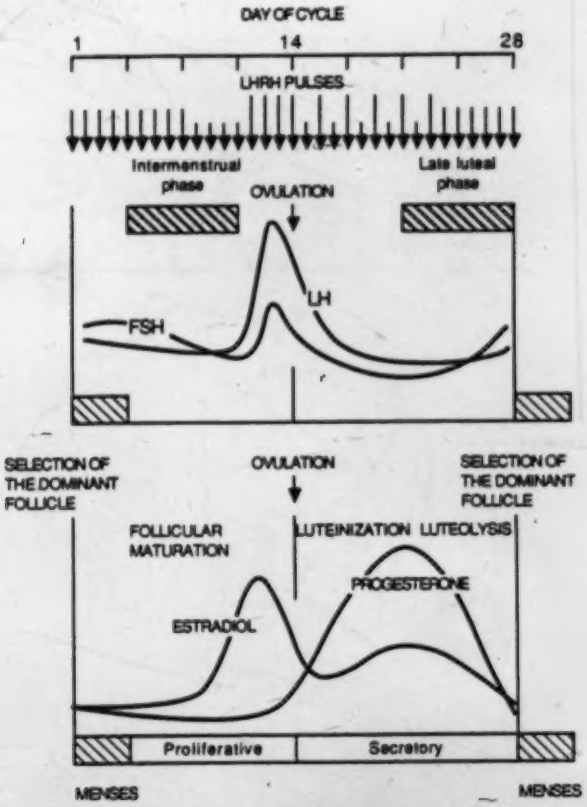
The menstrual cycle is a biological rhythm which occurs in girls and women of reproductive age. Menstrual bleeding occurs on a monthly basis. It is the external expression of the repetitive functioning of the hypothalmic-pituitary-gonadal axis. The axis is a functional endocrine system which has its anatomical structures in the hypothalmus, the pituitary and the ovary. The regulation of the functioning of the ovary is mediated through release of gonadotropin releasing hormone (GnRH) which controls the secretion of luteinizing hormone (LH) and follicle stimulating hormone (FSH) from the pituitary gland. LH and FSH are in turn directly responsible for follicular maturation, ovulation, and luteinization of the follicle. Luteinization is the process whereby the post-ovulatory follicle is converted into a steroidogenic organ primarily producing progesterone. Accompanying these morphological changes is a series of well-coordinated fluctuations in the circulating levels of ovarian steroid hormones (sex hormones), particularly estradiol (an estrogen) and progesterone. These steroid hormones are responsible for the development of the endometrium and their withdrawl leads to the shedding of the lining of the uterus, which is menstruation. Feedback of steroid hormones also modulates hypothalamic-pituitary function. Ovulation occurs approximately

midway through a 28-day cycle. Prior to ovulation, the phase during which maturation occurs is named the follicular phase. The post-ovulatory phase is the luteal phase which is characterized by the secretion of progesterone from the ovary.

Day I of the menstrual cycle is that on which the menstrual flow commences. In the idealized, average 28-day cycle, ovulation is expected to occur on or close to day 14. The length of the follicular phase varies across women with cycles longer or shorter than 28 days. The length of the luteal phase generally remains constant. The premenstrual period during which symptoms occur is potentially synchronous with the luteal phase of the menstrual cycle.

Information adapted
(from Cumming, 1984, pp. 6-7)

Figure 7. The relationship of the hormonal and functional (ovarian) events of the menstrual cycle. Testing was done in the intermenstrual (Days 5-10) and late luteal (within 6 days of onset of subsequent menses) cycle phases.



Integration of hormonal and functional events of the menstrual cycle.

(Figure 7: modified from Cumming, D. C., Alterations of the menstrual cycle. Medicine North America, in press.)

Appendix B

State-Trait Anxiety Mean Scores for Specific Groups

	STATE	TRAIT	
Misericordia Hospital Sample (N=80) Psychiatric, not seriously psychotic	52.85	55.78	(Zingle, 1986)
Neuropsychiatric	47.74	46.62	(Spielberger)
Depressive	54.43	53.43	(Spielberger)
Anxiety	49.02	48.08	(Spielberger)
Schizophrenia	45.70	45.72	(Spielberger)
General Medical	42.68	41.33	(Spielberger)
Working Adults (m & f)	35.46	34.84	(Spielberger)
Female Age 19-39	36.17	36.15	(Spielberger)
Edmonton Sample Random Sample N=150 Males & Females	34.45	35.48	(Zingle, 1986)

Appendix C

Sample Copies of the Instruments

The material in Appendix C has been removed because of the unavailability of copyright permission. The information in Appendix C included four instruments or data collection forms employed in this study. They were:

1. PREMENSTRUAL ASSESSMENT FORM (PAF). Halbreich, Endicott, and Schacht, 1982.
2. SUBJECT DATA FORM (SDF).
3. STATE-TRAIT ANXIETY INVENTORY (STAI), Forms X1, X2. Spielberger, Gorsuch, and Lushene, 1970.
4. IPAT DEPRESSION SCALE. Krug and Laughlin, 1976.